

# GROVE®

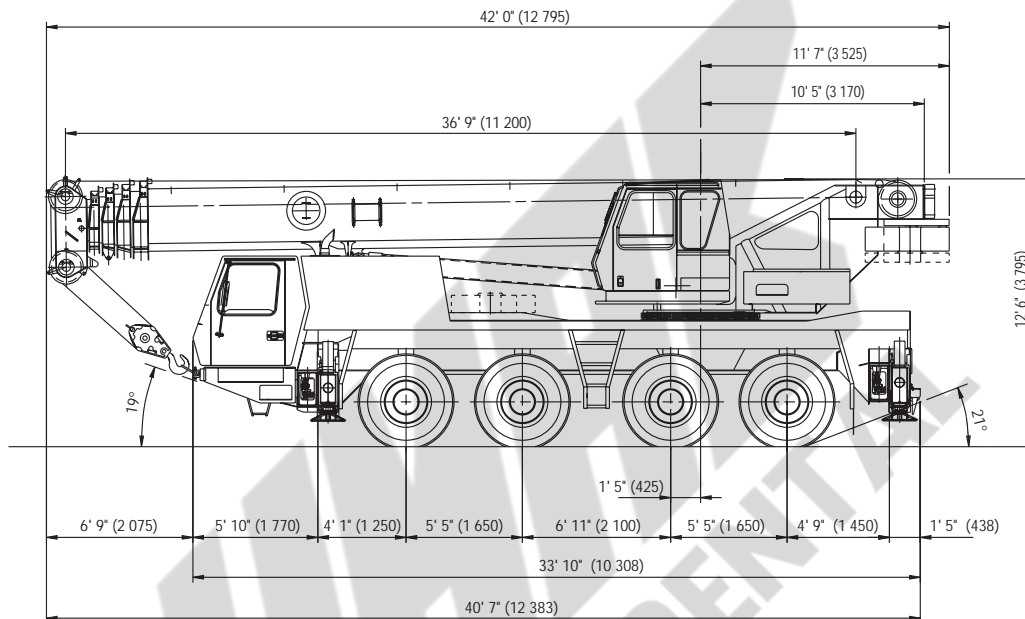
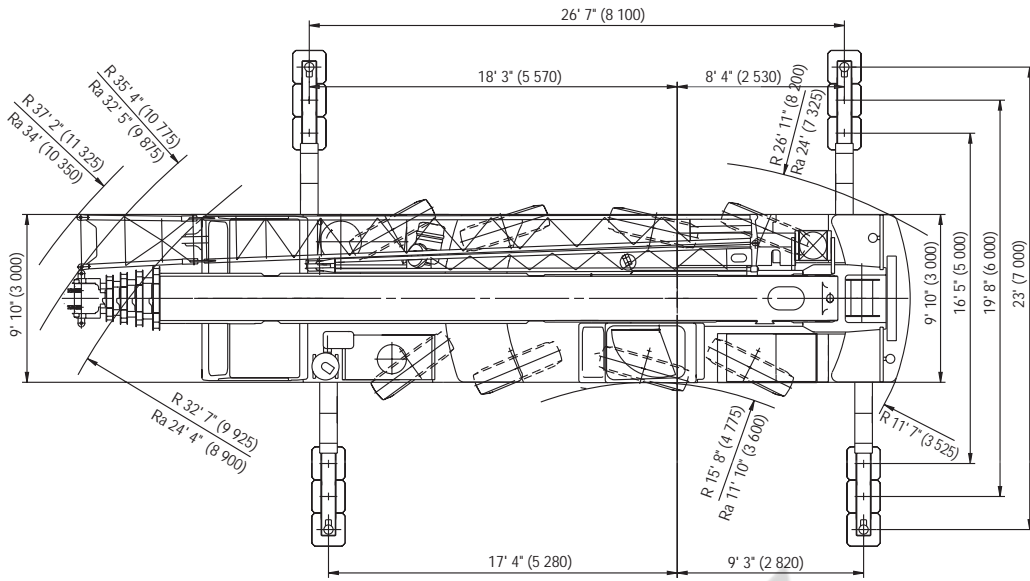
## **GMK4090**



**ALL TERRAIN HYDRAULIC CRANE**



# Dimensions



Note: ( ) Reference dimensions in mm

## BASIC WEIGHTS (LBS.)

Mercedes power, 20.5 tires, auxiliary hoist, 2nd oil cooler, outrigger pads, hydraulic offsettable swingaway with hydraulic reel, 8 x 6 x 8, 1.3MT counterweight bolted to superstructure.

	Axles 1 & 2	Axles 3 & 4	Total
	53,989	34,229	88,218
<b>Additions:</b>			
Auxiliary boom nose	428	-251	177
20.5 Spare tire	-642	1,451	809
Driveline retarder	-55	496	441

\*Additional counterweight 3.3MT on carrier, 5.0 MT on S/S in addition to above to provide 22,220 lbs. (10.1MT) total counterweight

8 x 8 x 8 drive	584	165	749
-----------------	-----	-----	-----

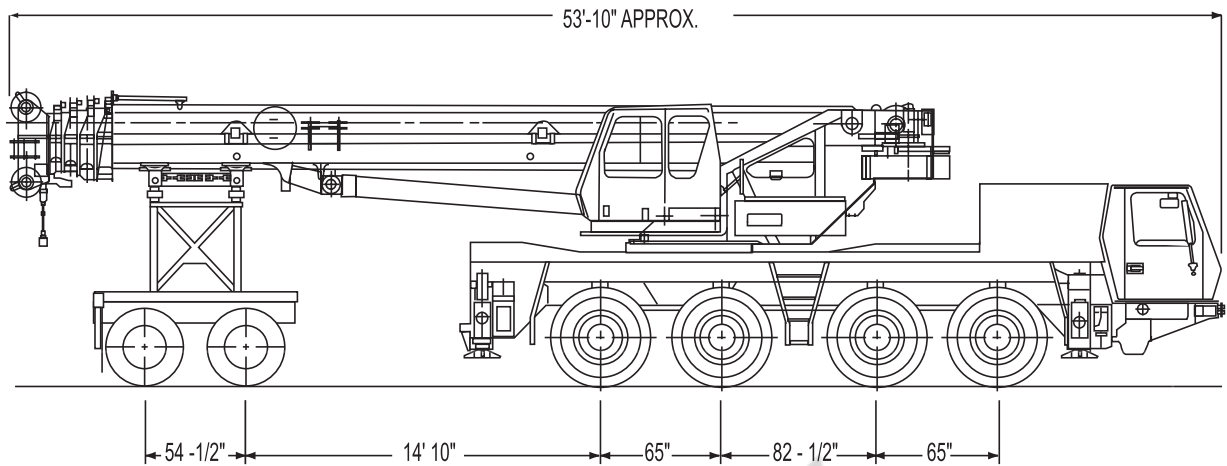
## REMOVAL:

*Substitute IPO counterweight in lieu of auxiliary hoist	298	-500	-202
Remove hydraulic swingaway	-3,386	741	-2,645
16.00 tires in lieu of standard 20.5	-556	-370	-926
14.00 tires in lieu of standard 20.5	-1,349	-899	-2,248

Reflects weight with superstructure facing forward.

\* Auxiliary hoist is considered as part of the counterweight. Please see counterweight configuration sheet for build-up.

# GMK4090 Trailing Boom Proposal



Dolly Axles  
22,444 lbs.

Rear Axles  
26,588 lbs.

Front Axles  
44,787 lbs.

G.V.W.  
93,819 lbs.

## Unit configured as follows:

- 37-142 ft. Boom
- 1.3MT counterweight on superstructure
- 20.5 tires
- 8 x 6 x 8 Drive
- Outrigger pads on machine
- Main & auxilliary hoists with wire rope
- 33-56 ft. hydraulically offsettable swingaway
- Additional oil cooler
- 2 Axle boom dolly (5,700 lbs.)

***Weights may vary due to manufacturing tolerances***

THIS ILLUSTRATION IS ONLY A GUIDE. CONSULT FACTORY FOR SPECIFIC DETAILS.

# Superstructure Specifications

## Boom

37 ft. - 142 ft. (11.2 m - 43.2 m) five section, full power boom with patented TWIN-LOCK™ boom pinning system. Maximum tip height: 151 ft. (46 m)

## Boom Elevation

Single lift cylinder with safety valve provides boom angle from -3° to +82°.

## Hydraulically Offsettable Lattice Extension

33 ft. - 56 ft. (10 m - 17 m) bifold lattice swingaway extension hydraulically offsettable and luffing under load from 5° - 40°. Controlled from the crane cab.

## Lattice Jib Extension

Two 16 ft. (5 m) inserts for use with lattice swingaway extension to increase length up to 72 ft. (22 m) or 87 ft. (27 m).

## Load Moment & Anti-Two Block System

Load moment and anti-two block system with audio/visual warning and control lever lockout provides electronic display of boom angle, length, radius, tip height, relative load moment, maximum permissible load, load indication and warning of impending two-block condition.

## Cab

All aluminum construction cab is tiltable (- 5° to +15°) and includes safety glass and adjustable operator's seat with hydraulic suspension. Other features include engine dependent hot water heater, armrest integrated crane controls, and ergonomically arranged instrumentation. Drive/steer controls.

## Swing

Axial piston fixed displacement motor and planetary gear box. Holding brake and service brake.

## Counterweight

35,400 lbs. (16 000 kg) consisting of various sections with hydraulic installation/removal system controlled from the superstructure cab.

## Hydraulic System

2 separate circuits, 1 axial piston variable displacement pump (load sensing) with electronic power limiting control and 1 gear pump for swing. Dual thermostatically controlled oil coolers keep oil at optimum operating temperature. Tank capacity: 263 gal. (680 l)

## Control System

Full electronic control of all crane movements using electrical control levers with automatic reset to zero. Controls are integrated with the LMI and engine management system by CAN-BUS. ECOS system with graphic display.

## Hoist

Main and auxiliary hoist are powered by axial piston motor with planetary gear and brake. "Thumb-thumper" hoist drum rotation indicator alerts operator of hoist movement.

	Main	Auxiliary
Line length:	720 ft. (220 m)	720 ft. (220 m)
Rope diameter:	16 mm	16 mm
Line speed:	410 ft./min. (125 m/min)	410 ft./min. (125 m/min)
Line pull:	11,240 lbs. (50 kN)	11,240 lbs. (50 kN)

## Electrical System

24 V system with three-phase alternator 28 V/80 A, 2 batteries 12 V/170 Ah.

## \* Optional Equipment

- \* Engine-independent hot water heater, with engine pre-heater
- \* Second spotlight
- \* Stereo/cassette player
- \* Air Conditioning

\*Denotes optional equipment

# Carrier Specifications

## Chassis

Box-type, torsion resistant frame is fabricated from high-strength steel.

## Outrigger System

Four hydraulic two-stage outrigger beams with vertical cylinders and outrigger pads. Outriggers can be set in four positions:

Fully extended 100% - 23' (7 m)  
- 19' 8" (6 m)  
- 16' 5" (5 m)

Fully retracted (0%) - 7' 7" (2.3 m)

Independent horizontal and vertical movement control on each side of carrier. Electronic crane level indicators at each control station. Automatic level system on carrier.

## Engine

Mercedes-Benz OM501LA, diesel, 6 cylinders, water cooled, turbo charged, 422 HP (315 kW) at 1800 rpm  
Max. torque: 1,475 ft./lbs. (2000 Nm) at 1080 rpm  
Engine emission: EURO II/EUROMOT/EPA/CARB (non road)

## Fuel Tank Capacity

106 gal. (400 L)

## Transmission

ZF-AS TRONIC automatic, 12 forward and 2 reverse speeds. Single speed transfer case with inter-axle differential lock.

## Drive/Steer

8 x 6 x 8

## Axles

1st axle line - drive/steer  
2nd axle line - steer  
3rd axle line - drive/steer (connects for all-wheel steer)  
4th axle line - drive/steer  
Drive axles with planetary hub reduction and center mounted gearing.

## Suspension

GMK4090 features the Grove exclusive MEGATRAK™ suspension on all wheels independent hydroneumatic system with hydraulic lockout acting on all wheels. The suspension can be raised 6-1/2" (170 mm) or lowered 5" (130 mm) both longitudinally and transversely and features an automatic leveling system for on-highway travel.

## Tires

8 tires, 20.5 R25.

## Steering

Dual circuit steering system is hydraulic power assisted with a transfer case mounted, ground driven, emergency steering pump. Axles 1, 2, and 4 steer on highway. Separate steering of the 3rd and 4th axle for all wheel steer and crab-steer is controlled by an electric rocker switch.

## Brakes

Service brake: pneumatic dual circuit acting on all wheels, air dryer. Anti-lock braking system (ABS). Permanent exhaust brake and constant throttle brake. Parking brake: pneumatically operated spring loaded brake acting on axle lines 2 & 4.

## Cab

Two-man, aluminum construction driver's cab includes the following features: safety glass; driver and passenger seats with hydraulic suspension, engine-dependent hot water heater, complete instrumentation and driving controls.

## Electrical System

24 V system with three-phase alternator 28 V/100A, 2 batteries 12 V/170 Ah.

## Maximum Speed

49 mph (78.5 km/h) with 20.5 R25 tires.

## Gradeability (Theoretical)

70% with 20.5 R25 tires.

## Miscellaneous Standard Equipment

Trailing boom kit (less dolly); additional hydraulic oil cooler; spare tire and wheel - 20.5 R25 with carry bracket; working light; tool kit; fire extinguisher; rooster sheave; radio cassette in carrier cab.

## \* Optional Equipment

- \* 8 x 8 x 8
- \* Electric driveline retarder
- \* 16.00 R25 tires (vehicle width 9 ft. 10 in. [3 m])
- \* 14.00 R25 tires (vehicle width 9 ft. [2.75 m])
- \* Engine-independent hot water heater, with engine pre-heater
- \* Trailing boom "boost" weight transfer kit
- \* Air conditioning

\* Denotes optional equipment

# Working Range



37 - 142 ft  
(11.2 - 43.2 m)



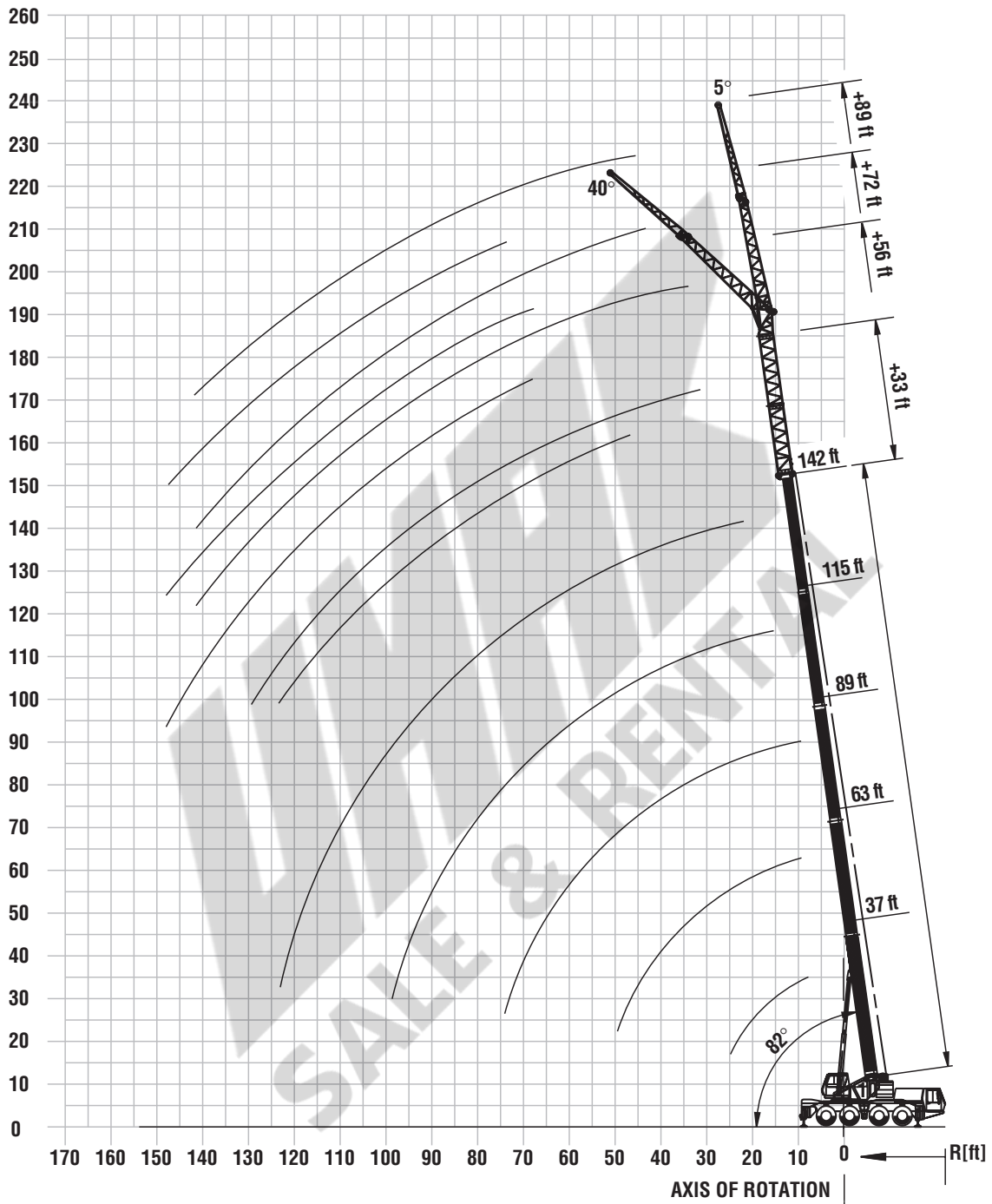
33 - 89 ft  
(10 - 27 m)



100%



360°





37-142 ft. (11.2-43.2 m)		35,400 lbs. (16 100 kg)		100% 23' Spread		360°		Pounds (thousands)			
Feet	37*	50	63	76	89	102	115	128	141		
8	165.0										
9	158.0										
10	147.0	155.0	136.0	129.0	123.0	81.0					
15	116.0	116.0	112.0	105.0	99.0	81.0	59.0				
20	94.0	94.0	92.0	89.0	84.0	81.0	57.0	42.4	34.0		
25	72.0	72.0	74.0	73.0	68.0	67.0	51.0	42.4	34.0	26.6	
30			55.0	56.0	56.0	53.0	46.0	39.6	33.8	26.6	
35			42.8	43.8	43.8	43.0	41.6	35.8	32.0	26.6	
40				35.6	35.4	35.0	35.8	32.2	29.4	26.6	
45				29.6	29.4	28.8	29.8	28.6	27.0	24.8	
50				25.0	26.2	26.0	25.2	25.6	23.8	22.8	
55					22.6	22.4	22.4	22.0	21.8	21.0	
60					19.8	19.4	19.8	19.2	19.2	18.4	
65					17.4	17.2	17.4	17.0	16.8	16.0	
70						15.4	15.4	15.0	14.6	14.0	
75						13.6	13.6	13.2	13.0	12.2	
80							12.2	11.6	11.4	10.8	
85							10.8	10.4	10.2	9.4	
90							9.8	9.2	9.0	8.2	
95								8.2	8.0	7.2	
100								7.4	7.0	6.4	
105									6.2	5.6	
110									5.6	4.8	
115									5.0	4.2	
120										3.6	
125										3.2	
130										2.6	

\*Lifting capacities greater than 127,000 lbs. require additional equipment.

37-142 ft. (11.2-43.2 m)		22,200 lbs. (10 100 kg)		100% 23' Spread		360°		Pounds (thousands)			
Feet	37*	50	63	76	89	102	115	128	141		
8	165.0										
9	158.0										
10	147.0	155.0	136.0	129.0	123.0						
15	116.0	116.0	112.0	105.0	99.0	81.0	59.0				
20	89.0	89.0	89.0	83.0	78.0	81.0	57.0	42.4	34.0		
25	60.0	60.0	62.0	63.0	60.0	81.0	51.0	42.4	34.0	26.6	
30			46.0	47.0	47.0	81.0	43.0	39.0	33.8	26.6	
35			35.6	36.6	36.4	37.6	35.4	33.6	31.4	26.6	
40				29.4	30.8	30.4	29.4	29.0	27.8	26.2	
45				24.4	25.6	25.2	25.6	24.8	23.8	22.2	
50				20.6	21.6	21.6	21.6	21.2	20.6	19.2	
55					18.4	18.4	18.6	18.2	17.8	16.6	
60					16.0	16.0	16.0	15.6	15.4	14.4	
65					13.8	13.8	13.8	13.4	13.2	12.4	
70						12.0	12.2	11.6	11.4	10.8	
75						10.6	10.6	10.2	10.0	9.2	
80							9.4	8.8	8.6	8.0	
85							8.2	7.8	7.4	6.8	
90							7.2	6.8	6.6	5.8	
95								6.0	5.6	5.0	
100								5.2	4.8	4.2	
105									4.2	3.6	
110									3.6	3.0	
115									3.0	2.4	
120										1.8	

\*Lifting capacities greater than 127,000 lbs. require additional equipment.

37-142 ft. (11.2-43.2 m)		3,900 lbs. (1 800 kg)		100% 23' Spread		360°		Pounds (thousands)			
Feet	37	50	63	76	89	102	115	128	141		
10	155.0	136.0	129.0	121.0	81.0						
15	106.0	93.0	86.0	77.0	68.0	59.0					
20	65.0	61.0	57.0	52.0	50.0	46.0	41.2	34.0			
25	42.8	45.0	42.4	41.4	38.4	36.6	34.0	31.6	26.6		
30		32.8	33.2	32.4	30.8	29.2	27.2	25.4	23.2		
35		24.8	26.2	26.4	25.0	23.8	22.2	20.6	18.6		
40			20.8	21.8	20.6	19.6	18.2	16.8	15.2		
45			16.6	17.8	17.2	16.4	15.0	14.0	12.4		
50			13.4	14.4	14.4	13.8	12.6	11.6	10.2		
55				12.0	12.0	11.6	10.6	9.8	8.4		
60				9.8	9.8	10.0	9.0	8.2	6.8		
65				8.2	8.2	8.2	7.6	6.8	5.6		
70					6.8	7.0	6.4	5.6	4.4		
75					5.6	5.8	5.4	4.6	3.6		
80						4.8	4.4	3.8	2.6		
85						4.0	3.4	3.0	2.0		
90						3.2	2.8	2.4			
95							2.0	1.8			

Lifting capacities greater than 127,000 lbs. require additional equipment.

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

		33 FT		56 FT		72 FT		89 FT	
		20°	40°	20°	40°	20°	40°	20°	40°
Feet	5°								
35	13.8								
40	13.8			8.2					
45	13.8	14.2		8.2					
50	13.8	14.2	11.4	8.2		6.6		5.0	
55	13.8	14.2	11.4	8.2	8.2	6.6		5.0	
60	13.8	14.2	11.4	8.2	8.2	6.6	6.6	5.0	
65	13.8	14.2	11.4	8.2	8.2	6.6	6.6	5.0	
70	13.8	13.8	11.4	8.2	8.0	6.6	6.6	5.0	5.0
75	12.2	13.0	11.4	8.2	7.8	6.6	6.6	6.2	5.0
80	10.8	11.6	11.4	8.2	7.6	6.4	6.6	6.2	5.0
85	9.6	10.2	10.8	8.2	7.4	6.2	6.6	6.6	6.2
90	8.4	9.0	9.4	8.2	7.2	6.2	6.6	6.6	6.2
95	7.4	7.8	8.2	8.2	7.0	6.0	6.6	6.6	6.0
100	6.4	6.8	7.2	7.4	6.8	6.0	6.6	6.6	6.0
105	5.6	6.0	6.4	6.6	6.8	6.0	6.4	6.4	6.0
110	5.0	5.2	5.6	5.8	6.4	5.8	5.6	6.2	5.8
115	4.2	4.6	4.8	5.0	5.8	5.8	5.0	5.6	5.8
120	3.6	4.0	4.2	4.4	5.0	5.6	4.4	5.0	5.6
125	3.0	3.4	3.4	3.8	4.4	5.0	3.8	4.4	5.0
130	2.6	2.8	3.0	3.4	3.8	4.4	3.2	3.8	4.4
135	2.2	2.2		2.8	3.4	3.8	2.8	3.2	3.8
140	1.6	1.8		2.4	2.8	3.2	2.4	2.8	3.2
145	1.2	1.4		2.0	2.4	2.6	2.0	2.4	2.8
150				1.6	2.0	2.2	1.6	2.0	2.2
155					1.6	1.8		1.6	1.8
160								1.4	1.6

		33 FT		56 FT		72 FT		89 FT	
		5°-20°	20°-40°	5°-20°	20°-40°	5°-20°	20°-40°	5°-20°	20°-40°
Feet									
50	12.6								
55	12.6		10.4						
60	12.6		10.4	7.4		6.0			
65	11.0		10.4	7.2		6.0			
70	9.6		10.4	7.0		6.0		4.6	
75	8.4	9.0		6.6	5.8	6.0	5.6	4.6	
80	7.4	8.0		6.4	5.8	6.0	5.6	4.6	4.6
85	6.4	7.0		6.2	5.6	6.0	5.6	4.6	4.6
90	5.6	6.2		6.0	5.6	6.0	5.6	4.6	4.6
95	5.0	5.4		5.6	5.4	6.0	5.6	4.6	4.6
100	4.2	4.6		4.8	5.4	6.0	5.4	4.6	4.6
105	3.6	4.0		4.2	5.0	5.8	5.4	4.6	4.4
110	3.0	3.4		3.6	4.4	5.2	5.2	4.6	4.4
115	2.6	2.8		3.2	3.8	4.6	5.2	4.4	4.4
120	2.2	2.4		2.8	3.2	4.0	4.6	3.8	4.2
125	1.8	2.0		2.2	2.8	3.4	4.0	3.4	4.0
130	1.4	1.6		1.8	2.4	3.0	3.4	3.0	3.4
135				1.6	2.0	2.6	3.0	2.6	3.0
140					1.6	2.2	2.6	2.0	2.6
145						1.8	2.2	1.8	2.2
150						1.4	1.8	1.4	1.8
155							1.4		1.4

		33 FT		56 FT		72 FT		89 FT	
		5°	40°	5°	40°	5°	40°	5°	40°
Feet									
35	13.8								
40	13.8			8.2					
45	13.8	14.2		8.2					
50	13.8	14.2	11.4	8.2		6.6		5.0	
55	13.8	14.2	11.4	8.2	8.2	6.6		5.0	
60	13.6	14.2	11.4	8.2	8.2	6.6	6.6	5.0	
65	12.0	12.8	11.4	8.2	8.2	6.6	6.6	5.0	
70	10.4	11.2	11.4	8.2	8.0	6.6	6.6	5.0	5.0
75	9.0	9.8	10.6	8.2	7.8	6.6	6.6	6.2	5.0
80	8.0	8.6	9.2	8.2	7.6	6.4	6.6	6.2	5.0
85	6.8	7.4	8.0	7.6	7.4	6.2	6.6	6.2	5.0
90	6.0	6.4	7.0	6.6	7.2	6.2	6.4	6.6	5.0
95	5.0	5.6	6.0	5.8	6.8	6.0	5.6	6.4	6.0
100	4.2	4.8	5.0	5.0	6.0	6.0	4.8	5.8	6.0
105	3.6	4.0	4.2	4.4	5.2	6.0	4.2	5.0	5.8
110	3.0	3.2	3.6	3.8	4.4	5.2	3.6	4.4	5.2
115	2.4	2.6	3.0	3.2	3.8	4.4	3.0	3.6	4.0
120	1.8	2.2	2.4	2.6	3.2	3.8	2.4	3.2	3.8
125	1.4	1.6		1.8	2.2	2.8	2.0	2.6	3.2
130				1.8	2.2	2.6	1.6	2.2	2.6
135				1.2	1.8	2.2		1.6	2.2
140					1.4	1.6		1.6	1.6

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

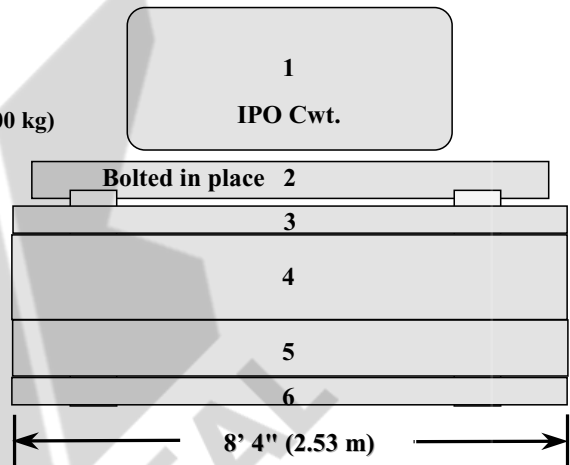


Feet	33 FT		56 FT		72 FT		89 FT	
	5°-20°	20°-40°	5°-20°	20°-40°	5°-20°	20°-40°	5°-20°	20°-40°
50	12.6							
55	12.6	10.4						
60	12.4	10.4	7.4		6.0			
65	10.8	10.4	7.2		6.0			
70	9.4	10.2	7.0		6.0		4.6	
75	8.2	8.8	6.6	5.8	6.0	5.6	4.6	
80	7.2	7.8	6.4	5.8	6.0	5.6	4.6	4.6
85	6.2	6.8	6.2	5.6	6.0	5.6	4.6	4.6
90	5.4	5.8	6.0	5.6	5.8	5.6	4.6	4.6
95	4.6	5.0	5.4	5.4	5.0	5.6	4.6	4.6
100	3.8	4.2	4.6	5.4	4.4	5.2	4.2	4.6
105	3.2	3.6	4.0	4.8	3.8	4.6	3.6	4.4
110	2.6	3.0	3.4	4.0	3.2	4.0	3.0	3.8
115	2.2	2.4	3.0	3.4	2.8	3.4	2.6	3.2
120	1.6	2.0	2.4	3.0	2.2	2.8	2.0	2.8
125		1.4	2.0	2.4	1.8	2.4	1.6	2.2
130			1.6	2.0	1.4	2.0		1.8
135				1.6		1.6		1.4

## Counterweight Configurations

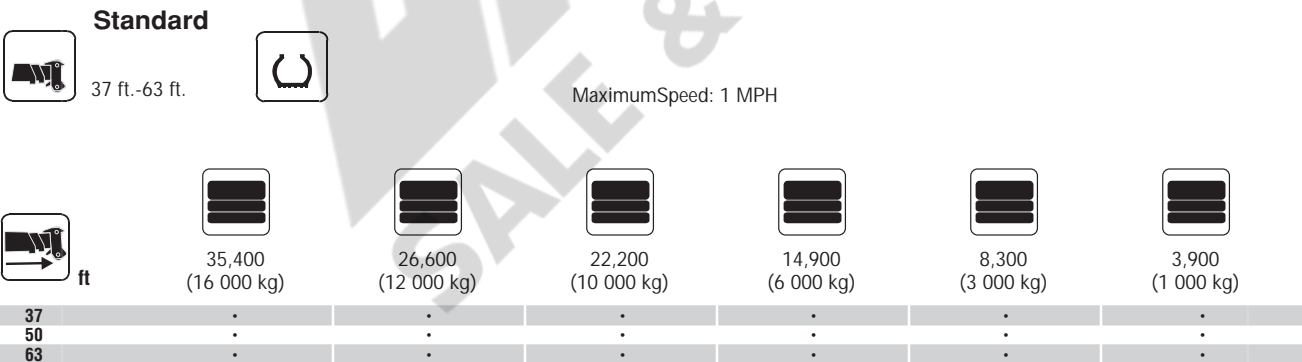
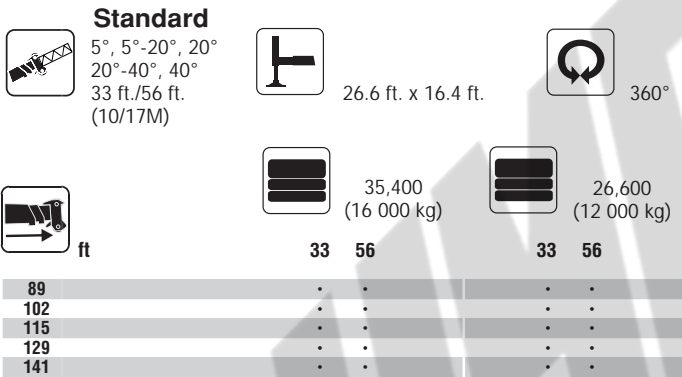
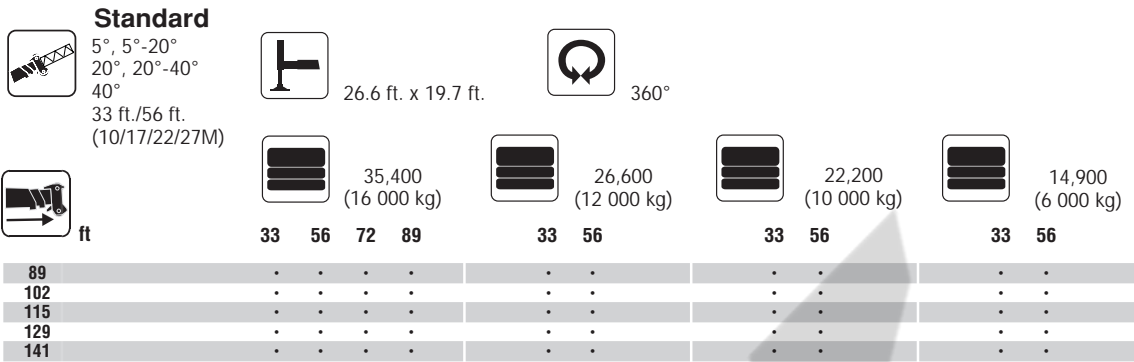
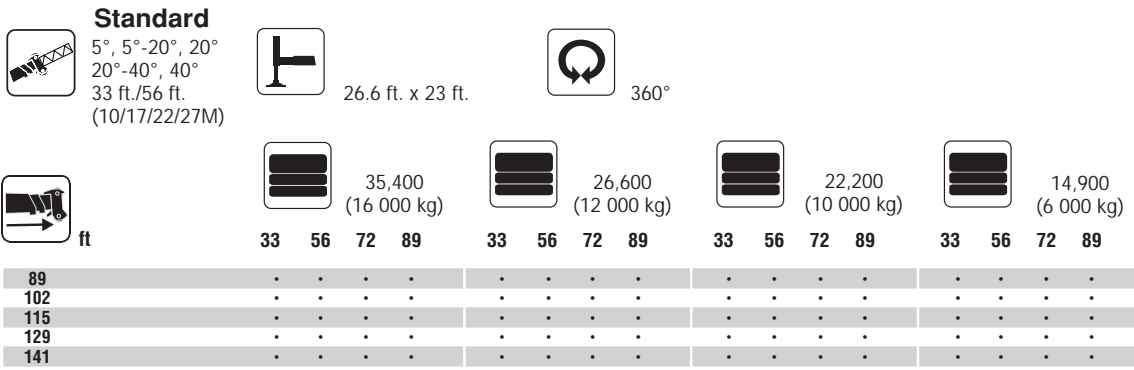
- 1,100 lbs. (500 kg)
- 2,866 lbs. (1 300 kg)
- 4,409 lbs. (2 000 kg)
- 11,023 lbs. (5 000 kg)
- 8,818 lbs. (4 000 kg)
- 7,275 lbs. baseplate (3 000 kg)

Counterweight	1	2	3	4	5	6
3,900 lb. (1 800 kg)	X	X				
8,300 lb. (3 800 kg)	X	X	X			
14,900 lb. (6 800 kg)	X	X		X		
22,200 lb. (10 000 kg)	X	X		X		X
26,600 lb. (12 000 kg)	X	X	X	X		X
35,400 lb. (16 000 kg)	X	X	X	X	X	X



## Overview of Standard Duty Charts

ft	37 ft.-142 ft.		26.6 ft. x 23 ft.		26.6 ft. x 19.7 ft.		26.6 ft. x 16.4 ft.	
	35,400 (16 000 kg)	26,600 (12 000 kg)	22,200 (10 000 kg)	14,900 (6 000 kg)	8,300 (3 000 kg)	3,900 (1 000 kg)		
37	•	•	•	•	•	•		
50	•	•	•	•	•	•		
63	•	•	•	•	•	•		
76	•	•	•	•	•	•		
89	•	•	•	•	•	•		
102	•	•	•	•	•	•		
115	•	•	•	•	•	•		
129	•	•	•	•	•	•		
141	•	•	•	•	•	•		



THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

# Rated Lifting Capacities

## IMPORTANT NOTES:

**WARNING: THIS CHART IS ONLY A GUIDE.** The notes below are for illustration only and should not be relied upon to operate the crane. The individual crane's load chart, operating instructions and other instruction plates must be read and understood prior to operating the crane.

1. All rated loads meet ANSI/ASME B30.5, Mobile and Locomotive Cranes. Testing and development were performed to SAEJ1063, Cantilevered Boom Crane Structures - Method of Test and SAEJ765 Crane Stability Test Code.


2. Capacities given do not include the weight of hook blocks, slings, auxiliary lifting equipment and load handling devices. Their weights must be added to the load to be lifted. When more than minimum required reeving is used, the additional rope weight shall be considered part of the load.

3. The machine shall be leveled on a firm supporting surface. Depending on the nature of the supporting surface, it may be necessary to have structural supports under the outrigger floats to spread the load to a larger bearing surface.

4. When either boom length or radius or both are between values listed, the smallest load shown at either the next larger radius or next longer or shorter boom length shall be used.

5. For outrigger operation, outriggers shall be properly extended with tires raised off the ground before operating the boom or lifting loads.

## Symbols Glossary

	Frame		Steering
	Outriggers		Transmission
	Outrigger Controls		Axles
	Engine		Brakes
	Fuel Tank Capacity		Tires
	Electrical System		Suspension
	Drive		Rotation
	Lights		Boom Elevation
	Cab		Swing
	Boom		Counterweight
	Fixed Swingaway		Oil
	Tele-Swingaway		Hydraulic System
	Lattice Extension (Luffing)		Hoist
	Boom Nose		Radius
	Boom Extension		Boom Length
	Speed		Hookblock
	Grade		Gear
	Lattice Extension		Luffing Jib

## GMK4090 Features and Benefits



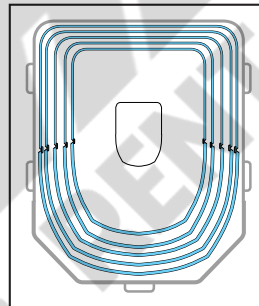
▶ MEGATRAK™ independent suspension and all wheel steer system allows all wheels to remain on the ground at all times so stresses and weight are not continually transferred between axles

▶ ECOS (Electronic Crane Operating System) computerized system continuously monitors and controls principle crane functions as programmed by an operator

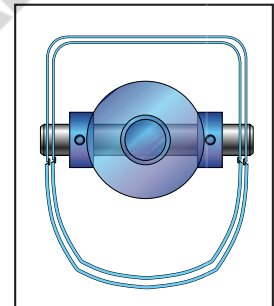


▶ EKS4 electronic load moment indicator operates in conjunction with ECOS continuously displaying crane configuration and load moment data

▶ MEGAFORM™ incorporates a "U" shape boom design which forms a natural cradle position for boom sections which eliminates stiffeners thus reducing weight and increasing capacity



▶ TWIN-LOCK™ boom pinning mechanism automatically pins the sections in position using two horizontal large diameter boom pins



### Grove Worldwide - World Headquarters

1565 Buchanan Trail East

P.O. Box 21

Shady Grove, Pennsylvania 17256-0021, U.S.A.

Tel: (717) 597-8121

Fax: (717) 597-4062

[www.grovetworldwide.com](http://www.grovetworldwide.com)

Constant improvement and engineering progress make it necessary that we reserve the right to make specification, equipment, and price changes without notice. Illustrations shown may include optional equipment and accessories and may not include all standard equipment.

GROVE® and GROVE LOGO are registered trademarks of GROVE in the U.S. and/or other countries. Copyright© 2000 GROVE. All rights reserved.